WG3 - Program Verification

Overview

Challenge

Formal verification involves solving intractable or even undecidable problems. Techniques and tools require a high level of expertise. This makes it difficult for the industry to embrace formal verification.

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Main Goal

Make techniques for program verification more effective and more accessible to all stakeholders.

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Main Goal

Make techniques for program verification more effective and more accessible to all stakeholders.

- exploitation of synergies among different verification areas
- taking advantage of advances on interoperability

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Activities

- Year 1: Kick-off meeting (Valencia)
  - bring together members of the different communities working on proofs and verification,
  - foster collaborations and build synergies among participants to ease the path to more fruitful results for the Action, and
  - the identification of verification techniques used in the Software Verification competition SV-COMP, which is related to the first deliverable of the WG.
- Year 2: Second WG3 meeting (Timisoara)
  - bring together members of the different communities working on proofs and verification,
  - foster collaborations and build synergies among participants to ease the path to more fruitful results for the Action,
  - make an inventory of the approaches used in the international Software Verification competition SV-COMP (Related to Deliverable 1).
  - realize state-of-the-art for tools approaching program specification as logical axioms; Requirements specification for the corresponding software prototype (Related to Deliverable 2).

Activities

- Year 3: EuroProofNet Tutorial on Usable Formal Methods for Security of Systems in March 2024 (Dresden)
    - bring together members of the different communities (including formal methods, systems engineering and security),
    - make formal methods more effective and more accessible to all stakeholders,
    - transfer knowledge in terms of expertise and scientific tools across the different disciplines and between academia and industry, and
    - foster collaborations and build synergies among participants to ease the path to more fruitful results for the Action.
- Year 4: EuroProofNet Workshop on Program Verification
    - bring together members of the different communities,
    - identify and share verification challenges with recipes,
    - celebrate results that advance the state of the art in the context of the WG3 goals and deliverables,
    - transfer knowledge in terms of expertise and scientific tools across the different disciplines and between academia and industry, and
    - foster collaborations and build synergies among participants to ease the path to more fruitful results beyond the end of the Action.

Activities

Shared with other WGs:

- Year 2: School on Verification Technology, Systems & Applications (VTSA'22)

- Year 3: School on Verification Technology, Systems & Applications (VTSA'23)

WG3 - Deliverables

- D3. Comparison of the approaches used in the international Software Verification competition SV-COMP and other relevant ones (March 2023)
  - We keep the wiki open and a survey has been launched to improve it

    Big thanks to Mădălina Erașcu!

WG3 - Deliverables

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- D6. Software prototype for the automated inference of program specifications as logical axioms. (September 2023)
  - Included in the mid-term report. Some issues solved.

WG3 - Deliverables

- D11. Collection of verification challenges with summary of working recipes for verifying them.
  - Wiki available. Will be enriched with the output from the final WG3 meeting in the following two weeks.

  Big thanks to speakers and participants in the final and the Dresden meeting!

WG3 - Deliverables

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- D12. Technique for syntax-semantics interface for program verification with or without type systems.
  - Links to research contributions are being added (R. Loukanova, A. Riesco *et al.*, ...) (big thanks too!)

Networking

- We received applications for STSMs in every call
- Granted around 20
- Excellent networking experiences during the meetings
- Participation of young researchers in the meetings
- The goal of WG3 is broader than the deliverables
  - many other contributions can be seen in the list of publications on the website

Conclusion

- Some challenges during the COST Action
  - First meeting: in a post-COVID context
  - Broad community – focus on the positive

- Goals achieved with the work of everyone

- Thanks to all EPN members, WG3 participants, LOS, proponents, . . .

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